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REVIEWS

Traité de géographie physique.—Climat—Hydrographie—Relief du sol—Biogéographie. By EMANUEL DE MARTONNE. Paris: Librairie Armand Colin, 1909. 8vo, viii+910 pp., 396 text figs. and maps, 48 phot. plates, 2 colored planispheres.

This work, as stated by one reviewer, is a mine of information with a wealth of useful illustrations. As stated in the author's preface, it aims to put the educated public on the track of important geographic publications, and to give to the specialist a general treatise that will aid in rounding out and properly orienting his special lines of research. Each subject discussed is followed by a full list of recent works bearing upon it, to be found in the French, German, and English languages, and occasional works in other languages. Topographic and other maps of value in illustration of the features discussed are cited by name or number, and include many from the United States as well as from most of the European countries, and a few from Africa and India.

Many of the illustrations are artistic sketches made by the author from nature. Representation in three dimensions is also a notable feature of the illustrations. The wealth of illustrations and of references is combined with a clear and vivid presentation in the text. It will be a useful work for schools as well as for the specialists and the educated public. The author's experience as a teacher as well as a field investigator counts in the preparation of this comprehensive volume. The author's special lines of investigation, glaciers and physiographic features, are handled with exceptional clearness, but the work shows evidence throughout of painstaking collaboration and treatment. As a basis for the discussion of certain subjects the classic works of Hahn, Haug, de Margerie, Angot, and others are freely drawn upon.

The first 72 pages deal with the form and situation of the earth as a planet, and the modes of representing the terrestrial sphere by various projections. The author recommends, and uses in this work, the Mollweide projection for maps of large area, but for topographic maps with a scale of 1:100,000 or less the use of polyconic projections is recommended. He deprecates the use in school atlases and wall maps of the Mercator projection with its exaggeration of polar lands, and urges that the projection be clearly stated on all maps for school use.

The elements of physical geography are discussed very briefly (pp. 73–96). Physical geography is defined as the science of the extent and reciprocal reactions of the phenomena by which the surface activity of the globe is manifested. It deals with an active or living surface, and its particular horizon is at the contact of the gaseous envelope with the solid and liquid parts of the earth's surface. The four main subjects of the work, as stated in the title, are "Climate, or the Physical Geography of the Air," "Hydrography, or the Physical Geography of the Water," "Terrestrial Morphology, or the Physical Geography of the Land," and "Biogeography," which brings out the relation of life to the various physical features.

Under "Climate" (pp. 97–251) are considered three elements, temperature, winds, and degree of humidity, the last named embracing evaporation, humidity, cloudiness, and rainfall. The state of climatological knowledge is set forth by a map (Fig. 38), a revision of one given in Bartholomew's *Physical Atlas*, while the various types of climate are presented on a colored planisphere prepared by the author. This represents for the entire globe 27 types of climate, 9 of which are equatorial and tropical, 5 subtropical, 6 temperate, 3 cold, and 4 desert types. Of the desert types 2 are warm climate (Peruvian and Saharian) and 2 cold climate (Patagonian and Aralian).

Under "Hydrography" (pp. 257–365) the first chapter deals with the ocean, and considers the features of the basins and the temperature and salinity of the water. The second chapter deals with the ocean currents. Then follow in turn chapters on the seas, the lakes, and the streams. Under rivers, attention is given to the relation of the sources to their regimen, and to various other problems of fluvial regimen, climatic, geologic, physiographic, and also the influence of the various types of vegetation.

Under "Terrestrial Morphology" (le relief du sol) the first chapter sets forth the relative value of various classes of topographic maps in giving a knowledge of terrestrial forms. Such maps, supplemented by sketches and views, are the principal sources of knowledge of the earth's features. An analysis is then given of the degree of complexity exhibited by the various forms, and the importance of erosion as a modeling agent is brought out. The several dominating forms of erosion and deposition as distributed on the face of the earth are set forth in a very instructive map (Fig. 172) as follows: (1) mechanical disaggregation with stream transportation, (2) mechanical disaggregation with wind transportation, (3) mechanical disaggregation with accumulation (in interior basins with dry climate), (4) areas of fluvial accumulation, (5) areas of eolian accumulation, (6) loess accumulation, largely eolian, (7) predominating chemical decomposition with fluvial erosion, (8 and 9) regions of present and past glacial erosion, (10) regions of Quaternary glacial accumulation.

The chapter devoted to the cycle of fluvial erosion is well illustrated by photographs and sketches and sections of maps. Another chapter deals with the influence of the physical properties of the rocks in giving certain features. In this chapter is also discussed the subterranean drainage and karst topography. One chapter each is devoted to the tectonic influences and the volcanic outflows in producing certain features. Following this comes a somewhat detailed discussion of the evolution of drainage systems, in which the nomenclature suggested by Davis is used to some extent. This chapter is exceptionally full of diagrams in three dimensions, prepared by the author, which bring out the stratigraphic conditions as well as the surface features.

A chapter on paleogeography with notions concerning the geologic evolution is perhaps more subject to question than any other part of the volume. The map of the continent of Gondwana (Fig. 271) (modified from Frech), which represents a land area stretching from Australia past Africa to South America in Permo-Carboniferous times, will scarcely be accepted by those who believe in the permanence of the ocean basins. It seems to be based largely upon the distribution of the Glossopteris and kindred plants in Permian time over this wide range of the earth's surface. In addition to this Permo-Carboniferous map of the earth there is one for the Upper Cretaceous (Cénomanien) and the Quaternary; the latter represents also the glaciation. In addition to these are representations of European Miocene and Pliocene distribution of land and sea. The mountain-making movements of Europe, in accordance with ideas of Suess and Marcel-Bertrand, are also brought out in two sketch maps (Figs. 270 and 273).

A chapter is devoted to glaciers and glacial topography (pp. 600–647), which is illustrated by a large number of excellent Alpine photographs and by numerous sketches by the author both of European and American features. These sketches as well as the maps and photographs and descriptions bring out the results of glacial erosion very clearly. The features of accumulation are treated more briefly. A map showing the extent of Quaternary glaciation in the United States (Fig. 298), prepared by Chamberlin in 1894 for Geikie's *Great Ice Age*, should have been replaced by a map showing more recent results of mapping of moraines in the United States. It also erroneously places the Illinoian glaciation in central Iowa.

A chapter is devoted to eolian action and desert forms and another chapter to the coastal topography.

The final subject, "Biogeography," is treated with great fulness (pp. 709–862), and takes up not only the general principles of biogeography, but goes into considerable detail in reference to plant communities in various climatic areas, tropical, subtropical, and temperate, in Alpine regions and Arctic zones, and in desert regions both cold and warm. Under "Zoögeography" the aquatic fauna is discussed in relation to its distribution in deep sea or on continental shelves, and in relation to varying degrees of salinity and warmth of water. The terrestrial fauna is considered in reference to physiographic conditions, food conditions, and climatic conditions.

F. L.

Yorkshire Type Ammonites. Edited by S. S. BUCKMAN. Part I. London, William Wesley & Son.

In this work the editor has undertaken to republish, with illustrations and critical notes, the descriptions of Lias Ammonites from Yorkshire, England, which were originally described by Young and Bird, and by Martin Simpson.

The original publication of Young and Bird, in 1822, appeared under the title *A Geological Survey of the Yorkshire Coast*, "Describing the Strata and Fossils Occurring between the Humber and the Tees, from the German Ocean to the Plain of York, by Rev. George Young, A.M., and John Bird, artist." A second edition, with many alterations from the first, appeared in 1828.

Martin Simpson's first work appeared in 1843 under the title *A Monograph of the Ammonities of the Yorkshire Lias*, "Containing the Specific Characters and Popular Notices of More Than 100 Species; with References to the Particular Beds and Localities Where Each Is to Be Found; Including, Also. the Two Species of Nautilus. Described from Nature, by Martin Simpson, Curator to the Geological and Polytechnic Society of the West Riding of Yorkshire and Late Keeper of the Whitby Museum, Lecturer on Geology, etc." In 1855 a second work by the same author appeared under the title *The Fossils of the Yorkshire Lias; Described from Nature*, "with a Short Outline of the Geology of the Yorkshire Coast. Illustrated with Sections; and Intended as a Guide to Strangers. By M. Simpson, Lecturer on Science, and Curator of Museums." A second edition of this work was published in 1884.

These works, highly important as they are, have never received proper consideration by students of Lias Ammonites, chiefly because they are for